



USCC COMPOST OPERATIONS TRAINING COURSE

August 2-6, 2010, SUNY Cobleskill

Session Summaries and Instructor Bios

Monday, August 2, 2010: The Composting Process

1. Compost Framework. Cary Oshins, US Composting Council

Cary will kick off the week with an overview of the course, and get right into it with a look at composting as a manufacturing process, with inputs, outputs, process controls and feedback loops. We'll cover some basic definitions and clarify what we will be and won't be studying (such as vermicomposting, anaerobic digestion, or the collection of compostables).

2. Compost Biology and Key Process Variables. Cary Oshins, US Composting Council

In the first half of this lecture Cary will look at composting at its core: a biological process. Who are the microbes that are doing the decomposition? How and why do they work? The second half we introduces the Key Process Variables: Feedstocks, Moisture, Oxygen, Pile dimensions, Temperature and Time. We will look at how we use these variables to control the process, and start to answer the question: "When is it done?"

3. Feedstocks and recipe building. Bob Rynk, SUNY Cobleskill

At the heart of the composting process is the mixing of the different ingredients, or "feedstocks" to produce a "balanced diet" for the microbes. Bob will present a "parade of feedstocks" and look at how we combine them into a "recipe", balancing the key factors of moisture, nutrients and air flow. Working in teams, students will get introduced to a Compost Calculator and try their hand at building their own recipes.

Field Session A.

After a lot of talk, it's time to get our hands dirty! We work as teams to take what was taught and put it in to practice. Your goal: as a team, build a 2-cubic-yard compost pile following and adapting the recipe you developed in class.

4. Systems, methods and equipment. Jean Bonhotal, Cornell Waste Management Institute

With a basic understanding of the core biological processes, how do we put a facility around them to manage the flow of materials from the time they enter your site to the time they go out as products? We'll examine the pros and cons of the turned windrow, aerated static pile and invessel methods. We'll look at the equipment needed to do all the work, from size reduction (aka grinding) to windrow management to product screening.

Tuesday, August 3: Site Design and Environmental Control

Field Session B.

Come to class with your boots on! We will go outside and learn how to do field testing for moisture, bulk density and free air space. Learn how to monitor and document the process.

5. Site selection and design. Bob Rynk

This session will start our examining where a compost site can and can't go. What the key considerations in siting a facility? Then we'll move in to designing the site. What are the components of a good design? How do they get laid out for efficiency and safety? We'll end up looking at the composting pad itself, and you'll get some practice figuring out how big the pad actually needs to be.

6. Water management. Tom Herlihy, RT Solutions LLC

On to every facility a little rain must fall. Or sometimes, a lot of rain falls! Protecting our water resources is a key responsibility of every compost facility. What can we do with the leachate the oozes out of our piles? How do we handle the water that runs off our sites? We will review the Best Management Practices for water management around compost sites.

7. Air and odor management. Stuart Buckner, US Composting Council

Odors are the main reason that compost facilities get shut down. Every facility should have an Odor Management Plan. This lesson teaches the basic elements of that plan, focusing on practical measures to mitigate and prevent odor problems.

Wednesday, August 4: Regulations and Site Visits

8. Regulations. Sally Rowland, New York State Department of Environmental Conservation

You can operate, but you can't hide. Compost facilities must comply with a variety of state and local regulations to protect public health, safety, and the environment. This session will help you identify the key permits you may need or offices to be in contact with, and will provide some advice for working with your regulators.

9. Field Trip.

We will go by bus to visit several local composters, and see how all the theory gets put into practice. The tour will also provide attendees with an opportunity to interact with state and local regulators and obtain a better understanding of regulators' issues and concerns at compost facilities.

Thursday, August 5: Product Quality and Marketing

10. Compost quality and analysis. Jean Bonhotal

What do we want to know about our compost? Is it done? Is it safe? What's in it? How does that effect it's use? We'll look at how and why we measure the key parameters in assessing compost quality. **PARTICIPANTS ARE ENCOURAGED TO SUBMIT THEIR OWN COMPOST SAMPLE FOR ANALYSIS** (done for free if submitted before July 1) or **BRING THEIR OWN (Seal of Testing Assurance) COMPOST** to be part of this session. [See instruction here.](#)

11. Compost uses and markets. Richard Stehouwer, Pennsylvania State University

What are the uses of compost? How does it work in the soil? Why should we use one compost one place and another someplace else? Rick will teach some basic soil science and then go over the major uses for compost, including landscaping, home and commercial horticulture, turf management, agriculture, stormwater management and environmental restoration.

12. Compost marketing and sales. David Hill, CycleLogic

What are the components of a compost marketing plan? Which uses will you target? How will your product get distributed? What kind of promotions, communications, and staffing do you need? This day concludes with an exercise where as teams you'll start to put together a marketing plan, with goals, objectives and activities.

Friday, August 6: Facility Management and Wrap-Up.

13. Health and Safety Issues in Composting. Nellie J. Brown, Cornell University, Bob Rynk,

This module covers the specific health and safety concerns of the composting operation, including mechanical hazards of equipment, heat/cold stress, overexertion injuries, engulfment, and the biological and chemical hazards of raw materials and the composting process steps. Compost fires, their causes and control, will be discussed. The discussion will focus on spontaneous combustion, the most prevalent cause of fires at composting facilities.

Field Session C.

After monitoring your piles for the week, it's time to break them down, look inside and see how they did.

14. Troubleshooting: Assessing Vulnerability and Planning for Recovery, Cary Oshins and Nellie J. Brown

Crises, such as natural disasters, injuries, process failures, odor problems, lawsuits, perceptions by neighbors, or financial problems, may affect the viability of a composting operation -- demonstrating the need to think strategically about a composting facility's

vulnerability. By assessing risks, we can prevent crises or lessen their impact. Vulnerability analysis takes the broadest view of your workplace by helping you to identify the wide range of potential crises or disasters your workplace could encounter. In today's world, it is no longer a question of whether a crisis will happen at your workplace, but rather when, which type, and how it will occur. In this module, we will explore a range of crises to which a composting facility may be vulnerable and begin the process of developing plans for recovery and business/operation continuity.

Instructors

Jean Bonhotal

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Jean has worked at the Cornell Waste Management Institute in solid waste education for over 20 years, first working for Cornell Cooperative Extension in Broome County, then for the Cornell Waste Management Institute. Jean initially worked to develop youth programs and then as the need increased, concentrated her efforts more on composting.

For the last ten years, she has been working on composting feedstock from food to manure to animal carcasses. Currently her time is split between manure and carcass & butcher waste composting education and research. Compost quality and consistency in the market place has also become a high priority, we encourage on-farm use but often farms are required to move nutrients off the farm. Transforming manure into compost is an effective, efficient way to accomplish that.

Previous experience includes working with different agencies including US Forest and National Park Service, US EPA, NYS DEC and the landscape and greenhouse industry. She received an M.S. degree in Education and Communication from SUNY Binghamton in 1991, a B.S. in Biology from Utah State University in 1984 and an A.A.S. in Natural Resources from SUNY Morrisville.

Nellie J. Brown, MS, CIH

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Nellie Brown is the Director of Workplace Health and Safety Programs for Cornell University's School of Industrial and Labor Relations. A Certified Industrial Hygienist, Diplomate of the American Board of Industrial Hygiene, biologist and chemist, Nellie provides on-site training and technical assistance services in a wide range of occupational safety and health matters including workplace exposure to chemicals, biological agents, ergonomics, confined space entry, occupational stress, shift-work and long hours of work, crisis and violence prevention, hazard analysis techniques, training techniques, and indoor air quality for employers, labor unions, and the public. She is a member of the American

Industrial Hygiene Association, the American Society of Agricultural and Biological Engineers, and the Water Environment Federation.

Nellie serves on a Cornell University Project Work Team on Composting and Land Application of Sewage Sludge. Some of her recent projects involve process failure and hazard assessment of anaerobic digesters used for processing manure and generating electricity on dairy farms; assembling the jobs and tasks which involve exposure to any of the 42 chemicals currently known to produce breast cancer; conducting a hazard analysis and recommending protection and prevention for workers collecting roadkilled deer and conducting whole-carcass composting of them; and conducting a hazard analysis for farm staff and others involved in depopulating flocks and performing whole carcass composting in the event of an outbreak of highly-pathogenic avian influenza

Stuart Buckner, Executive Director

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Dr. Buckner serves as the Executive Director of the U.S. Composting Council, a national non-profit organization dedicated to the development and expansion of the composting industry through education and research. He has more than 20 years experience in compost program development and implementation. Dr Buckner's research has focused on process management, odor control, and composting system design.

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Tom is a Founder and the CEO of RT Solutions LLC with over 20 years specializing in the design, permitting and operations of organic waste management projects. He holds a Master's degree in Agricultural and Biological Engineering, and a Bachelor's in Physics and Mathematics. His varied background includes working on a producing Dairy, serving as an Extension Agent in West Africa with the Peace Corps, and over 20 years as a Consulting Engineer to private and municipal clients. He has been the Primary Investigator on numerous research and development projects all dealing with waste processing technologies and the development of certified products for organic agriculture. He cofounded RT Solutions in 2004, and has since focused all of his professional attention on developing large scale vermicomposting systems and the production of multiple vermicompost-based products. RT Solutions' has built and operates the largest agricultural

vermicomposting facility in the World and is located in Avon, New York. To date, RT Solutions has produced and marketed over 1,000,000 pounds of vermicompost at premium value(s) under the brand name of Worm Power. In 2009, the company closed on \$3.5MM in financing from two parties and is currently in the construction phase of a 700% facility expansion.

David Hill

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Mr. Hill is the principal in CycleLogic Environmental Marketing and Consultation. He has more than 21 successful years in marketing and management experience, with an emphasis on product management, market development and value-added positioning in the solid waste management and organic resource recovery industries.

Previously, David was a project manager and marketing manager with Veolia Water North America at the Baltimore City Composting Facility. He was responsible for producing and successfully marketing between 75,000 and 85,000 cubic yards of compost per year, while managing this facility.

Before that, he managed three yard waste composting facilities serving 5 counties in the State of Maryland. The combined production for these facilities was greater than 160,000 cubic yards of compost annually.

Cary Oshins

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Cary is Educaiton Program Manager for the *United States Composting Council*, where his work focuses on member services, including education, communication, website development and policy development. Prior to this he was head of the Stormwater Management Division of Gardenique Landscaping, Inc. in Orefield, PA, where he represented Filtrexx[®] Erosion Control products. Cary has 20 years of experience in composting education, research, utilization and promotion, working for the Lehigh County Office of Solid Waste, the Rodale Institute, and Cornell University's Waste Management Institute. As consultant to the Professional Recyclers of PA, he developed, coordinated and

taught the organics component to PROP's award-winning Recycling Professional Certification Program.

Sally Rowland

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Sally has been employed at NYSDEC for 24 years. She is responsible for regulations governing organics recycling facilities. Sally is an Environmental Engineer 3, licensed in the State of NY. She received her Bachelor of Science in Chemical Engineering from Clarkson University and her Master of Science and Ph.D. in Environmental Engineering from Rensselaer Polytechnic Institute.

Dr. Robert Rynk

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Bob Rynk has been researching and teaching about composting for over 25 years. Bob is Associate Professor of Agricultural Engineering at the State University of New York, Cobleskill campus (SUNY, Cobleskill). His areas of expertise include waste management, natural treatment processes and alternative energy. Bob is the co-instructor for the "Foundations of Composting" short course, which is presented annually at the U.S. Composting Council conference and at other national venues. He regularly lectures at other national and international composting forums.

Previously, Bob was Senior Technical Editor for *BioCycle* magazine and Executive Editor of the peer-reviewed journal, *Compost Science and Utilization*. Prior to joining *BioCycle*, Bob was Associate Professor at the University of Idaho and an extension engineer at the University of Massachusetts. He has authored numerous publications about composting, waste management and energy. Bob was the editor and contributing author for the *On-Farm Composting Handbook*.

Richard Stehouwer, Associate Professor, Environmental Soil Science

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Dr. Stehouwer has been on the Crop and Soil Sciences faculty at Penn State University since 1997, and is the state extension specialist in environmental soil science. His extension program covers soil based recycling of by-product materials, compost production and utilization, recycling of urban/suburban organic materials back to agricultural soils, manufactured topsoils, mine reclamation, and remediation of contaminated soils and brownfields. Dr. Stehouwer maintains an active research program to support his extension efforts. Present and recent research projects include: organic carbon and nutrient dynamics in abandoned mined lands reclaimed with manure, production of biomass crops on reclaimed mined lands, use of spent foundry sands and composts as components of manufactured topsoil, and nutrient flux from mined lands reclaimed with biosolids. Dr. Stehouwer also teaches Introductory Soil Science to over 300 students each year at Penn State University.